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How Have Changes in Human Capital Investment Impacted the Development of the National Economy of Finland?

Helsinki Metropolia University of Applied Sciences

Bachelor of Business Administrstion

EBA

Thesis

25.05.2018

Helsinki Metropolia University of Applied Sciences

Author(s) Title Number of Pages Date	Tom Eklöf How Have Changes in Human Capital Investment Impacted the Development of the National Economy of Finland? 27 pages + 2 appendices 25 May 2018
Degree	Bachelor's degree of Business Administration
Degree Programme	European Business Administration
Instructor(s)	Michael Keaney, Academic Adviser, International Programmes, Metropolia Business School

This paper studies the link between human capital investments in Finland and economic growth. More specifically it will establish the link between education and national prosperity. Initially many of the cornerstones of investment theory and the production function have to be taken into consideration. These provide the idea behind the link. Throughout this paper that link is further developed through the use of varying streams of literature, including country-specific studies, theoretical points of view, econometrical calculations, as well as a number of governmental organisations providing first hand data.

Through these sources this paper is able to identify many of the limitations, challenges, and most importantly benefits of the investments. Some of the main challenges faced in Finland at the moment are regional gaps in wealth distribution, the drain of human capital out of the country and an aging population.

These challenges are being addressed by the Finnish policy makers when developing budgets, however this paper concludes that although investments into education certainly add value on a micro level in Finland, it can not be conclusively said that it directly impacts economic growth in the ways it is currently being measured.

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Contents

1. Introduction

Investment in human capital is an integral part of any country's economy and the development it undergoes (Pelinescu, 2014; Riley, 2012; Lucas, 1988; Mankiw et al., 1992; De la Fuente and Domenech, 2000, 2006). It is a vital, structural requirement in order for a country to be prosperous, regardless of the stage of development the economy is in. However, countries in different developmental stages will utilise human capital in very different ways, hence the way in which the investment is made will differ greatly from one country to another.

According to an OECD study (2014) and the report published by the World Economic Forum (2016) Finland is both one of the most developed countries and among the most competitive economies in the world. This needs to be taken into consideration when analysing the investment structure of the Finnish government. Government expenditure and investment are both topics which have been widely discussed in the recent years as a result of the aftermath of the global economic crisis, and what role the governments have played in attempting to remedy the situation. More specifically, the importance of investment in human capital is increasing as a result of quick technological advances, a decreased dependence on fossil fuel resources, as well as an ever more internationalised market (Hanushek, 2013).

However, the investments governments make into human capital will not show visible results immediately, as the ways governments are able to invest in the human capital are generally through education and healthcare. Understandably, the effects of these investments will only start to show once the infrastructure supporting them is in place and the people have been subjected to the new investments for long enough so that they have had time to impact the wider population.

While both healthcare and education are relevant targets for investment in human capital, due to the different levels of development the current national health situation in Finland does not pose any restrictions on the workforce in comparison to the rest of the EU (European Commission, 2005). While this paper will further discuss this claim in the 'Findings and analysis' section, the focus of this paper will be on the investment into education and its resulting effects.

There are multiple factors which affect success of education as an investment in human capital. Both the distribution of education expenditure and the overall political, economic, and social situation of the country play an important role in how well education is able to enhance human capital (Rodriguez & Pose, 2008)

A review of earlier research used for this paper will be provided and its relevance will be explained. The validity and reliability of the data used will also be determined through analysis and comparison. Once the adequacy of the sources is determined the main findings will be presented and analysed before drawing conclusions.

This thesis will focus on analysing the effects of changes in human capital investment in Finland. While there are multiple studies which focus on comparing different countries to one another, many of them are outdated, and therefore do not take into account the severe recession in the Euro Zone. Furthermore, there is a clear lack of research specific to the Finnish economy. By including these elements this thesis will determine the impact of education investment and so build further on the existing research.

2. Literature Review and Methodology

Before beginning to analyse the current situation in Finland this thesis will offer an overview of the existing theory relating to human capital and its development. The application of the theory will then be analysed through the comparison of prior, existing studies in the field.

Human capital can be defined as "[the] measure of the economic value of an employee's skill set" (Investopedia, 2017). Similarly to all other types of capital, it can be invested in. This is done through education, training, and even healthcare to some extent. Although the basic definition of human capital in widely accepted, there are a number of different views on the more specific defining characteristics. One of the earliest points of view and indeed mentions of human capital as a contributing factor in the production function is that of Theodore Schultz (1961). He came to the conclusion that the output measured by the existing models was higher than the sum of all the inputs. While this had earlier been attributed to exogenous factors such as technology, or other scientific advances, Schultz argued that all of those factors were the result of advances in the capabilities of humans, and that human capital is the ability to adapt in situations of disequilibrium (Tallman et. al., 1992)

A later, and perhaps even more straightforward view is that of Gary Becker (1975), who claimed that human capital can be compared to physical stock and that it is a direct part of the production function. This meant that human capital should no longer be treated as the vague equaliser in the equation, but it is rather one of the building blocks of generating output. By attributing more of an emphasis on education, it allowed for Becker to focus many of his studies more strongly on measuring the impact of changes in human capital. In the 1970's Becker studied the educational preferences in Americans based on their expected returns. His research has since been used widely to further develop many of the econometric functions attempting to quantify human capital.

Investment in human capital is generally accepted to be any investment action that adds measurable value to an employee's skill set. In theory any schooling or training should therefore qualify as investment in human capital. Alternative sources of human capital are underlying values passed down through family or in the society. As with any investment the return on the investment is carefully evaluated, and when the returns start diminishing an alternate investment is necessary. However, the basic theory of scarcity also dictates that there will be an opportunity cost for investing in human capital. Regardless of the local solution

in place to invest in human capital, particularly the educational system throughout this paper, it will always result in decreased spending on an alternative in the immediate present. On a longer timeline though, human capital theory, and indeed any investment theory, suggests that, if successful, investment creates additional value that would not otherwise exist. The problem with human capital, and arguably other investments too, is that determining the present value in practice is very difficult, due in large part to the difficulty of producing estimates of the opportunity cost of capital necessary to calculate the NPV.

Even so, over the past decades there have been a number of econometrical models attempting to quantify both human capital and economic growth separately as well as together. Schultz (1961) stated that the rate of investment in human capital is a combination of the inputs of capital and labour, time, physical and mental powers of the individual, and human capital. This meant that an addition of any of these factors would mean an increase in the rate of investment in human capital. Transversely, should any of the factors be decreased, then the investment would go down. This is a basic way of identifying the opportunity cost of the investment.

One of the major limitations with this model is its inclusion of components which are near impossible to measure, such as innate ability and amount of effort which is put in. While these factors make it harder to quantify the output, they are nonetheless necessary in order to capture the complete picture (Tallman et. al., 1992).

To be able to accurately measure the impact of the investment on the economic growth, another vital aspect is to measure the production of the economy to an equal level of accuracy. One of the earlier measures used for this calculation was the Solow-Swan model. It measures the amount of output can be produced by combining amounts of physical capital and labour. Most importantly it relies on including an exogenous labour modifying tech-factor in the equation. While this model is able to show the relationship between the total input and the total output, it was strongly criticised for depicting a steady state relationship between the various input factors. The alternative modification to the Solow-Swan model is the endogenous growth model, below:

$$Y = AF(K, HL),$$

which utilises human capital as the labour modifying factor, instead of an exogenous tech factor. In the model Y is the aggregate production output, AF represents the disembodied

technological factor, K is physical capital, L is labour, and most importantly H is human capital, the labour augmenting human factor. This means that all of the economic output and growth can be attributed back to a factor which can be controlled and developed.

The link between economic growth and investment in human capital has been established through multiple studies, some of which will be thoroughly analysed in this paper. The resulting findings of this paper will contribute and add to the already existing array of research in the field of national economics and investment policy. It will portray the causes and effects of the changes in the investment in human capital and propose alternatives to the historical courses of action by the government.
This is done through building on prior studies in the field, procured mainly through research and economic journals, but also through comparing government spending information to changes in demographics and ranking results.

Some of the most relevant streams of literature on which this paper is built are in alphabetical order:

- Beine, M., Docquier, F., Rapoport, H., 2008. Brain Drain and Human Capital Formation in Developing Countries: Winners and Losers. The Economic Journal. Volume 118, Issue 528, 631-652).
- Hall, J., Ludwig, U., 2009. Gunnar Myrdal and the Persistence of Germany's Regional Inequality. Journal of Economic Issues, 43, 345-352.
- Hanushek, E.A., Woessmann L., 2007. The Role of Education Quality for Economic Growth. World Bank Policy Research Working Paper No. 4122.
- Kokkinen, A., 2012. Inhimillinen pääoma edistää merkittävästi talouskasvua [Human Capital Improves Economic Growth Significantly]. Hyvinvointikatsaus 4/2012.
- Krueger, A.D, Lindahl, M., 2001. Education for Growth: Why and for Whom?. Journal of Economic Literature. Volume 39, 1101-1136.
- Kuhl Teles,V., Andrade, J., 2008. Public investment in basic education and economic growth. Journal of Economic Studies, Vol. 35 Issue 4, 352-364.
- Ozturk, I, 2008. The role of education in economic development: a theoretical perspective. MPRA, [Online]. Paper #9023, 1-8.

The different streams complement each other in both the sources they use as well as the arguments they present. Hanushek and Woessmann (2007) and Hanushek (2013) present the

more substantial streams that this paper is based on. Their studies of educational quality and quantity of learning is extensive on a global scale. It also corresponds well with the research question presented for this paper, as they attempt to establish a correlation between education and economic development. However, their study lacks depth in detail as it focuses on general trends within education, rather than singling out specific countries and their policies. Furthermore, their research focuses heavily on the differences between the quality of education and the amount of schooling each individual attends. However, to reach a point at which it is possible to focus on the efficiency of the education, the national level of education must first be at an adequate level. This they argue is one of the many problems developing countries face.

What they found was that the quality of the education provided has a strong correlation with the person's individual economic prosperity. More alarmingly, they argued that the quality of education in developing countries is significantly worse than other studies have suggested, and that simply investing more money into an educational system which does not work, will not improve it significantly.

Hanushek and Woessmann argue that adding more resources to the educational institutions will not drastically improve the outcome, and it cannot be assumed to generate growth by itself. Interestingly in the case of the Finnish educational system, which has for a long time been considered to be one of the best educational systems, the reverse is happening. The current cuts in many educational budgets are both stripping resources from the institutions, as well as forcing them to undergo structural reforms. These changes attempt to create a more efficient system, while reducing the resources they have available (Aedo et al, 2017).

One of the main conclusions provided by Hanushek and Woessmann is that educational policy in many cases does not include enough incentive for the schools to increase their performance. Traditionally most of the incentives for schools to perform well have been increased resources. They have been based on imperfect systems measuring quality of education, such as standardised testing or number of graduates. In their study Hanushek and Woessmann suggest three alternate incentives for improved performance, namely: choice of school and competition between schools, decentralisation of regulation and autonomy for the schools, and accountability of the outcomes. A lot of their data came from their own previous studies, with added components from other authors, some of which are also used for the purposes of this paper.

The work of Finnish researcher Arto Kokkinen (2012) on how human capital aids development was also used for this thesis. This study focuses more on the Finnish situation and is heavily based on Finnish sources. He attempts to quantify the total human capital in Finland over the past century. He does this using a cointegrated vector auto regression model, in which he analyses the relationship between GDP per capita and GDP per working hour. While this provides a rudimentary picture of the productivity over time, and an insight into the Finnish policies, it does not take into consideration the future developments, nor does it suggest concrete improvements. In the research Kokkinen attempts to determine whether education affects development, or development affects education. The study is completed for the Centre of Statistics in Finland and is therefore more quantitative than this paper will be. Kokkinen argues that education has indeed had an effect on the historic economic growth, that the effects of an increase in human capital might be more substantial than previously thought, and that education itself should be accounted for as an investment in the national economy

In their article "Education for Growth: Why and for Whom?" Krueger and Lindahl (2001) attempt to bring together research done in both the microeconomic as well as the macroeconomic fields to portray a combined picture of the situation. The paper analyses the rate of return of education and concludes that while there are both benefits and drawbacks that can be seen as a result of investment in education, the study's findings are inconclusive in determining a holistic picture.

The research by Krueger and Lindahl is one of the literature streams used by Hanushek and Woessmann (2007) In their article "The Role of Education Quality for Economic Growth". By using both articles as sources for this paper, a clear development in the research can be seen. While Krueger and Lindahl findings are largely inconclusive, the work by Hanushek and Woessmann concludes that on a macroeconomic level education is indeed a major driver for growth. However, without the adequate measures to quantify the impact of education alone, it remains difficult to conclusively identify continued investment as a driver for growth.

This is also seen a Tallman et. al. study (1992) which analyses a number of empirical studies as well as models attempting to measure the impact of human capital investment of economic growth. It identifies many of the limitations of the models and concludes that there is a positive correlation between higher investment in human capital and higher output as well as individual earnings. However to measure the impact on national economic growth is harder due to

multiple immeasurable factors, variable rates of growth, and potential threshold levels that exist in economies.
The threshold levels also give evidence for the hypothesis that in order to sustain higher levels of growth, greater investment is required.

Finally, the article 'The role of education in economic development: a theoretical perspective' by Ozturk provides a much-needed theoretical addition to this paper. It simply analyses the theory on educational policy and investment. While the article in itself may lack some depth, it is based on sources with much credibility and thereby it provides an efficient and qualitative point of view on the prevalent theory. Ozturk brings forth a substantial historical account on the subject and argues that "no economic development is possible without education" (Ozturk, 2008).

This stream of literature, in combination with data on the subject and other, less relevant sources of research all contribute strongly to this thesis. However, the combination of sources fails to answer the question: *How Have Recent Changes in Human Capital Investment Impacted the Development of the National Economy of Finland?*

This paper claims that recent changes in the investment in human capital, as well as the future development of the policies will directly impact the growth and development of the national economy of Finland. The sources used for the purposes of this paper come from a variety of publications, published in different countries, thereby minimising the potential bias they might portray. However, as the topic of this paper is about a specific country the majority of the data gathering has happened through governmental agencies' or intergovernmental agencies' websites. This method allows for the most recent data to be used. The usability of the data is in theory very wide, however as the topic of this paper is rather narrow its application will undoubtedly be limited.

3. Commentary on the Finnish educational system

The Finland of today is to a large extent the product of the strict redevelopment the educational system underwent in the 1960's and 1970's. One of the main goals of the educational reforms since the 60's has been "to provide all citizens with equal opportunities to receive a high-quality education, regardless of age, domicile, economic situation, gender, or mother tongue." This reform enabled a previously agrarian country to develop into the Nordic welfare state it is today. The current nine-year comprehensive primary education has been in place since the early 70's. It helped standardise the subjects and the level to which they were taught, as well as improve the accessibility of the education. It also required the teachers' education to improve, which in turn further aided the improvement of the teaching.

The early reform gave the country and its human capital an excellent starting point and a high standard, implemented widely throughout the country, the more significant reform came through the secondary education reform. Through it the quality and accessibility of upper education was dramatically improved.

The rewards of this system have gained international recognition in the past decade, with Finland landing in the top percentile in the PISA study many years in a row. Although the Finnish results have gone down in the latest ranking, according to the PISA rankings in 2015, Finland still ranks fourth in reading, fifth in science, and thirteenth in mathematics (Aedo, 2017).

After primary education, the Finnish system adapts the "duaali malli", or dual model in which the secondary and tertiary education are divided into specific academic and vocational sectors. The reform focused on enabling students with vocational secondary education to attend tertiary education. From 1974 to 1992 the enrolment in secondary education doubled. This meant that the human capital in Finland was able to add more and more value to the Finnish economy (OECD, 2010).

Compared to multiple other countries, the system in Finland allows for flexibility between the different institutions and qualifications. As a result of this, the potential for increase in the human capital is the same for everyone, regardless of institution. To some extent this can be attributed to the flexible structure in place for the running and management of education.

As a result of being publicly funded, all Finnish educational institutions follow policy that is implemented by the Ministry of Education and curriculum development by the National Board of Education. As can be seen in Figure 1, the flexibility becomes evident through the freedom the city councils and schools have in terms of developing curricula, allocating funding, and recruiting and training the staff. This guarantees efficient and locally functioning solutions to education, throughout the country (OECD, 2013).

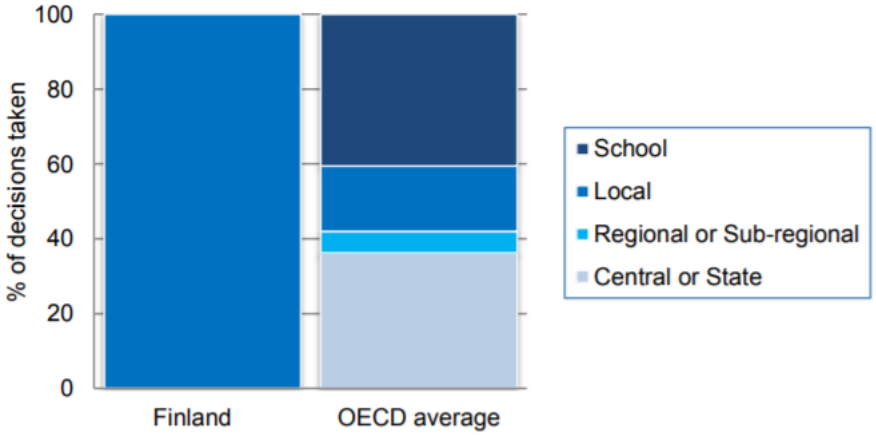

Figure 1: Percentage of decisions taken at each level of government (OECD, 2013).

4. Application of theory to Finland

The state of the Finnish national economy has until recently been rather negative. An article published by The Economist (14.8.2015) discussed the three-year recession in Finland from 2013 – 2015, which culminated in the Finnish economy being the only one within the EU which was still contracting at the end of 2015. An economic situation like this puts a lot of strain on government spending. According to an OECD study (2016) and as can be seen in Figure 2, Finnish government spending in 2014 was among the highest out of all the member states of both the OECD as well as the EEA. This recession ended in 2016, when the Finnish government published GDP growth figures of 1.4% (Statistics Finland, 2017).

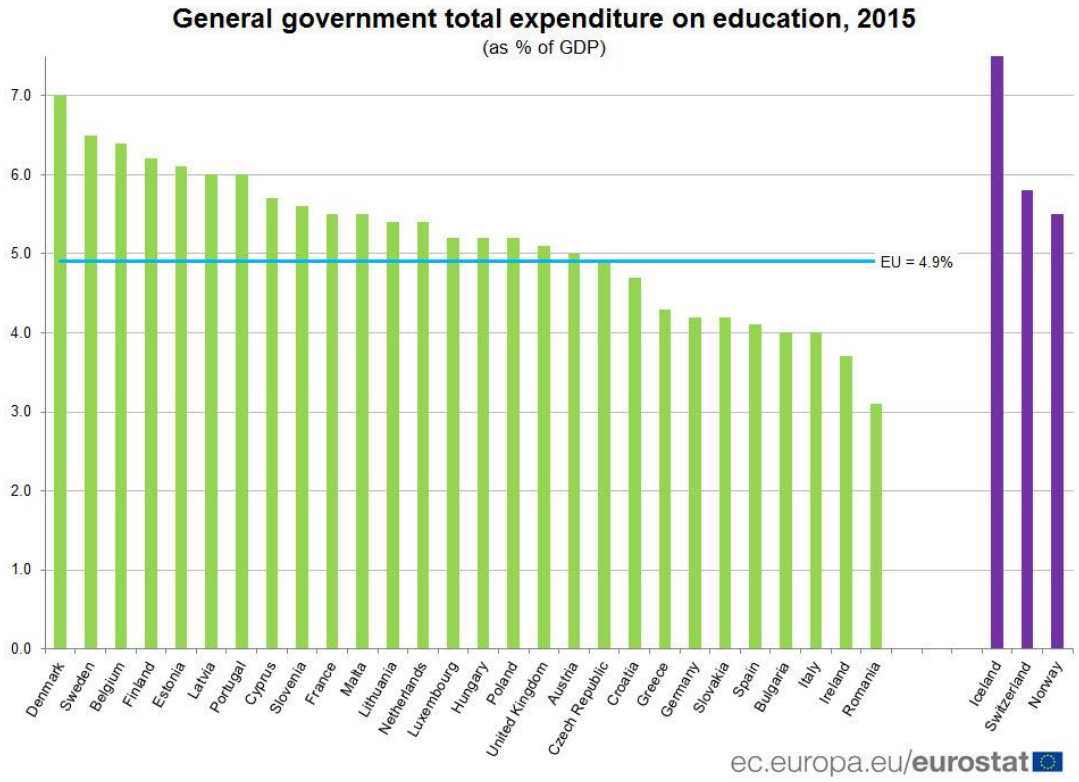

Figure 2: Government expenditure as percentage of GDP (European Commission, 2015).

The Finnish economy is in many ways benefitting from the current high government expenditure and investment into human capital. One of the most concrete ways this investment is done is through education. Another way of investing in the human capital of a country is through healthcare. However, the level of development within the Finnish economy and the health of the population do not deviate from the EU average [in terms of mortality,

life expectancy, obesity or cancer incidents] and the avoidable mortality[1] is among the lowest, therefore increasing the investments into healthcare will not have a significant effect on the Finnish economy (European Commission, 2005; OECD, 2016). While this is true, the investments of the Finnish government into healthcare cannot be overlooked, and decreases will arguably have great repercussions. For the purposes of this thesis however, the investment into healthcare will be assumed to stay at the current percentage of the GDP, and the effects of it to stay comparable to the current situation.

Because the primary comprehensive educational system in Finland is compulsory and all sectors of education are free it enables the entire population to attend, with negligible comprehensive school dropouts, and fewer than 4% from upper secondary education (UNESCO Statistics, 2011). Furthermore, as the entire population attends the same basic education it provides an equal ground for development, albeit there might be other factors creating inequality in the economy. This means that the distribution of the basic education is very widespread, and adequately covers the entire population. Hanushek and Woessmann argue in their research (2007) that the distribution of education is one of the most important aspects in determining its success.

To essentially have the entire population at the same basic level of education also means that employment becomes easier as national mobility is not restricted by the basic education. One of the faults that Tallman et al (1992) also point out is that the return on the investment in higher education – while neglecting primary education – is significantly lower.
The threshold levels that they discuss are also a factor that needs to be acknowledged. Essentially they argue that the effect of human capital investments appears in steps. This means that for the Finnish system to be as efficient as possible, this needs to be taken into account.

While this is a step in the right direction for the inclusion of economically less prosperous areas of Finland - which in turn will lead to increased growth - the standardisation of education is not enough. The issue of unequal distribution only arises in the higher levels of education. The higher the level of education, the more centralised the institutions are. This also leads to people with higher education not finding the more rural areas appealing (Hanushek et al., 2007). This is a perfect example of Gunnar Myrdal's theory of backwashing (1957). The theory

[1] Avoidable mortality refers to death from certain causes that should be avoided in the presence of timely and effective medical care (European Commission, 2005).

measures the adverse effect in one region, as a consequence of increased prosperity in another. Although regional differences can be the result of a number of attributes, namely the size of the land, capital stock, human capital, or political power, in developed countries the largest driver for regional inequalities is human capital (Hall et al., 2009).

In essence, by beginning to offer tertiary education more widely spread, the level of distribution will increase, and regional prosperity will not hinge only on the attractiveness of the area or the capital stock available, but also on the level of education of the residents. This applies particularly in the rapidly expanding technological industries, which are more human capital intensive. However, the institutions that have been active in these areas have not had the financial possibilities to improve people's skills' attainment (Kokkinen, 2012). This has led to many of them joining together to form larger, centralised entities. Even though this is financially the obvious solution, it does not provide the same equal distribution as a larger number of educational institutions would, and further contributes to the backwashing effect the centralisation has. Understandably though the investments required would be exponentially higher, and highly unlikely in the current economic and demographic situation.
Although financially more feasible, larger institutions come with added bureaucratic costs and more administrative duties, leading to diminished flexibility in decision-making which, a mentioned earlier is one of the defining benefits of the Finnish schooling system.

Regardless of the fact that the primary education offered is the same for everyone, according to a 2011 study by the OECD a clear gap is starting to be formed between high and low incomes in Finland. In a 2015 PISA study they also found the socio-economic background of the students to have an impact on their individual results. Given the equality and quality of the educational system, it is alarming that student performance is starting to be affected by the income inequality as it can easily lead to the start of a vicious cycle of exponentially increasing inequality (Aedo, 2017).
While not the fault of the educational system itself, it could partly be remedied by it. That would – however – mean that the role of the educational institutions in Finland would have to evolve to offer students even stronger support in order to combat these differences, which in turn will likely require more funding.

There are however also studies which suggest that some inequality in both income and education can act as an incentive for growth. Rodriguez-Pose and Tselios (2008) found that if kept low enough, regional differences in income and education will stimulate growth.

However, they found this to be more prominent in developing economies with high social mobility. While Finland certainly offers an environment with high social mobility, it is by no means a developing economy and the effect of regional differences can therefore be argued to have more adverse effects than beneficial ones.

Regional inequalities can over the longer term also benefit from the opposite theory to backwashing – the spread effect (Hall et al., 2009). It's defined as the regional prosperity in one area directly benefitting the growth of another. Currently however, the distribution of university degrees is relatively focused to certain regions, in which the larger universities are located. This leads to large regional build ups of certain skillsets. Although mobility in the workforce is relatively fluid, it still poses a restriction.

A potential solution for this comes as a result of the research by Kokkinen (2012). He stipulates that if the increased investment in human capital was done to restructure the system so that there would be a wider variety of secondary and tertiary degrees on a national level, this would increase employment in the less crowded fields. Simultaneously it would also decrease the number of graduates from the most popular fields, in which the supply of workers is too high. Although this would obviously put a strain on the educational institutions to be able to attract students to the less attractive fields of study, further away from large urban centres, it could lead to a virtuous cycle for the economy. A more equal distribution of secondary and tertiary education would lead to higher employment in the economy that in turn would result in a boost in taxes, consumer spending, and confidence, which would enable the government to cut some of its own spending. Even though this is a possibility, it needs to be acknowledged that any changes in educational policy do not impact the current economic situation, rather the situation in the coming 10-50 years. As this is the case, it is unlikely for the policies to change drastically as the political scene is already rather strained and a complete educational restructuring would most likely pose high risks as well.

To have a well-qualified workforce increases the productivity, output, and efficiency of the economy (Case, 2007; Hanushek, 2013). These aspects are increased as a result of being familiar with the newest technology and theory in the field as well as being taught the value of internationalisation (Ozturk, 2008). This corresponds with the argument made by Schultz (1961), that any unaccounted-for output in the economy stems from an increase in the human capital. Because education is something that primarily affects the economy on a micro level, and then in turn entire companies, which then work together to affect an entire market, and ultimately the entire economy is affected by benefits gained on a micro level. The study by

Becker in 1975 which measured the desired income based on education, is also directly applicable here. He assumed that individuals with higher income would directly contribute more towards the total output. Education therefore not only teaches the use of new technology and the application of theory, but also requires higher personal efforts the higher the level of education is. An unexpected positive effect therefore also comes from education in the form of working habits (Krueger et al., 2001, Ozturk, 2008).

The Finnish economy has long been subjected to very specific trends in education. Traditionally the Finnish economy has relied heavily on manufacturing. To some extent this prosperity in manufacturing is due to the dual model in the education, making the vocational degrees more attractive.

This system which is rather similar to the German vocational system, has for a long time enabled many Finnish students to quickly add value to the national economy through other than academic studies.
Although still prominent in Finland, both the manufacturing sector's decreased competitiveness globally as well as the lower transferability of the vocational training have resulted in a lower total output. To regain this competitiveness, there is a need for highly skilled workforce in many of the manufacturing industries. However, the current trend in tertiary education is moving away from the technology and industrial fields of study, and towards academic studies, specifically 'Administration and Commerce' (Statistics Finland, 2015). In addition to creating discrepancies in the supply and demand for workers this also tends to result in some educational institutions being crowded while others remain struggle to attract enough students (Kokkinen, 2012), again adding to the potential backwash effect.

One potential reason for this change away from the traditional manufacturing jobs, could also be a direct result of the disproportionately high decrease in funding for the secondary vocational training which were implemented at the height of the Finnish recession, through the fiscal restructuring of the Sipilä government in 2015. This inevitably decreases the attractiveness of the fields of study it offers (Liiten, 2017). Rather interestingly, this came at a time when the Swedish government decided to double its expenditure on vocational education (Christodoulou, 2016).

Historically this has been tough on the Finnish labour market, as the mobility of labour internationally has not been very efficient (Ministry of Education and Culture, 2011). However,

now as the Finnish educational system caters - conservatively speaking - for the entire EU, the expanded job market allows for people educated in Finland to easily move away, or contrastingly people who have been educated elsewhere can easily move to Finland. As the job market grows, the potential employees also increase in number. While there are multiple benefits from a larger area of potential employment, the concept of brain drain[2] will simultaneously also become an issue (Beine, 2008). Brain drain is generally argued to be a significant drawback of internationalisation, and another contributing factor to the backwash effect, as the investment in human capital will drain away with the migrating people. As the educational opportunities are not equally distributed both nationally as well as internationally, the human capital will drain to the areas with better employment and educational opportunities to offer. Beine calls the resulting phenomenon the detrimental growth effect, in which there is "imperfect substitution between skilled and unskilled labor" (ibid). This is one of the most important aspects that increased investment in the human capital needs to address.

The correlation between a higher education and a higher salary, shown in Appendix 1, might in many cases be what makes higher education attractive. This was also one of the main findings by Hanushek and Woessmann (2008) and Becker (1975). However, this correlation could also well have an impact on the economic development. More specifically, the previously mentioned growing inequalities in income could also be a result of the correlation between higher education and higher income. Generally, the more disposable income people have the more they spend, thus injecting more of their income back into the economy, aiding development (Case, 2007). However, it can be argued that up to a certain degree an increase in disposable income might not be spent, but instead saved. Therefore, even though increased salaries are correlated with higher education, the impact they have on the economic development are not solely positive but could actually be partially responsible for one the major growing issues of the Finnish national economy: income inequality.

According to the OECD, the most positive impact of investment in education is the intergenerational equality it supports. In Figure 3, on the next page, the relationship between the intergenerational earnings mobility and the income inequality can be seen. Earnings mobility refers to the extent to which the earnings level can change between generations. Finland in this case can be seen to have a low-income inequality and a very high mobility in

[2] "The migration of people endowed with high level of human capital" (Beine, 2008).

intergenerational mobility. One factor affecting this is the educational system in place in the country. To support this, the countries situated in the lower right-hand corner of Figure 3, are all countries scoring high on the quality of education, thereby showing that countries with high levels of education also exhibit high intergenerational earnings mobility (OECD, 2013).

Figure 3: OECD study on income inequality (Education Today, 2012).

To have high intergenerational earnings mobility clearly benefits the economy, because it makes it possible for the entire population - regardless of background - to succeed. By establishing this, the Finnish educational system is clearly successful at educating the portion of the population who attend higher education. However, the issue that remains is the geographical division of the education in Finland, as can be seen in Figure 4. While Figure 4 shows a clear focus of educational institutions in the southern part of Finland, it still does not do justice to the real division which is in the number of graduates.

Figure 4: Dispersion of tertiary educational institutions in Finland (Google Maps, 2017).

Even though the most important effect gained from investment in education is the increase in skills and knowledge, due to the relatively small classes (Ministry of Education and Culture, 2014) in the lower education and constant interpersonal relations taking place the educational system also educates children in social behaviour. When the primary education provides an experience that is positive, it should encourage people to continue their studies for a longer time. It can be seen in the study done by the European Commission in 2010, that Finland has one of the highest percentages of people with a tertiary education degree (Eurostat, 2010). This is partly again due to the dual sector model, placing value on the secondary and tertiary vocational education, but also especially because even the tertiary education in Finland is free.

The educational policy in Finland is affected by a number of aspects. Because the education in Finland is made equally available for the entire population, and it is provided for free, the investment into the education part of human capital improvement is significant. In 2016 Finland was investing 6.0% of its GDP in educational institutions. In strict monetary terms that means Finland was spending roughly EUR12.26 billion (Statistics Finland, 2017) on educational institutions which, if Finland had a different policy on education, could have been spent otherwise. For example, it could decrease the amount of public debt which is currently increasing at an alarming rate, which surpassed the 60% limit set by the European Commission in 2014, and is forecasted to keep rising at least until 2019 (Financial Times,

2017; Reuters, 2015). While this is still lower than the EU average of 83.2%, the Finnish national debt has kept increasing while the EU average debt has been decreasing since 2014 (Eurostat, 2017).

However, the opportunity reward of not spending on education is arguably marginal. The educational situation in Finland, where the ranking of the educational system has decreased in the PISA ranking (2015) is not improving and needs the investment in order to maintain its competitiveness, and by extension Finland's competitiveness. While the investment in educational institutions stayed at 6.0% of GDP from 2013 to 2014, due to the contracting national economy, the actual amount invested dropped by roughly EUR20 million (Statistics Finland, 2016).

The decreased investment in education can partly be explained by an ageing population. This opens the question of the demographic development of Finland in comparison to its educational spending. Even though everyone in Finland is not only entitled to, but in fact forced to attend the primary comprehensive education, the amount of primary school students has decreased by over 10% since 2000 (Statistics Finland, 2000-2015). This, will only decrease further in the coming years, as the birth rate in Finland has continuously decreased until 2015, which is the latest published statistic by the Family Federation of Finland (Väestöliitto, 2015).

The larger culprit in the decreasing of the educational investment is undoubtedly the current macroeconomic situation which forces the government of Finland to save in order to not further increase the public debt. Another alternative is the point argued by Hanushek (2013; Hanushek et al., 2007) that increases in skills due to education can stem either directly from increased investment, or from structural reforms to the underlying system. While it is clear that both of these components are necessary, the state of the Finnish educational system might therefore also need structural reforms. This need was addressed in 2015, when the Sipilä government devoted EUR300 million for structural changes in the system, including developments in primary education, improving the transition from education to work, and further integrating ICT into education (Ministry of Finance, 2015). As restructuring the infrastructure necessary to sustain education also requires significant monetary investment, it becomes hard to distinguish between the two, from a rate-of-return perspective.

The question of whether human capital is regarded as inherently endogenous or exogenous also comes into question here. If the infrastructure of the educational system needs to be

restructured it could imply that certain exogenous components are necessary. However, if the restructure is viewed as another source of endogenous growth then the arguments made by Becker (1975) about the role of human capital as one of the inputs in the economic output calculation, still hold.

Therefore, although the absolute amount invested in education has decreased in Finland, relative to GDP Finland still invests more into education than the EU average (European Commission, 2015). More comprehensive education would create employment, not only through teaching but also through the building and maintaining of the infrastructure. It would also allow for currently unemployed people to more easily attend further training and education, which will only improve the future outlook of the economy. While it is understandable that the government is looking for short term solutions in order to save, the opportunity cost is the long term decrease in human capital.

Recently the question has arisen if the GDP and its related measures are accurate ways to measure the economic growth and prosperity of a country. At a recent World Economic Forum annual meeting, the appropriateness of GDP was questioned. It was suggested that an 'Inclusive Development Index', or IDI, would be more suitable to capture economic growth. It would measure the average household standard of living through income, employment opportunity, economic security, and quality of life.
When comparing the IDI to GDP per capita in Appendix 2, a weak correlation was observed. A significantly higher number of countries reported GDP growth than were found to have improved IDI scores. While it is clear that GDP growth, and particularly when measured on a per-capita level, is imperative the results by the World Economic Forum suggest that they do not reflect the welfare of the individuals (Samans, 2018).

Another of the questions that arise from the dual model of the Finnish education is whether it's ideal to distinguish between them at all, or if they should be considered as one. The benefits of removing the dual labels could include equal opportunity in terms of resources, enabling closer interaction and degrees including aspects of both sectors, which could further broaden the skillset of the graduates. These benefits have to be weighed against the potential drawbacks of losing the specialisation that the distinction provides (Rutonen, 2015).
Furthermore, currently some of the purely vocational training is aiding the integration of immigrants into the Finnish job market, as the skills are very transferrable, and the training doesn't require strong Finnish, Swedish, or English language skills (CEDEFOP, 2015).

5. Conclusion

Through the analysis this paper provides, the question of how changes in human capital investment have impacted the development of the national economy of Finland is evaluated. This is done through the extensive data gathering to support the previous research. As a result it can be seen that changes in the human capital investment structure and policies greatly affect not only the economic situation within Finland, but also the growth and competitiveness of Finland on the international scale.

This paper adds value to the existing research through the fact that it combines the theory with the global trends and shows that they correlate in the case of the Finnish economy. However, while they correlate there are areas of limitation present within the research. To adequately measure the impact of human capital investment, and subsequently education, a much longer time frame of research is required. Furthermore, as brought up by Kokkinen (2012) in his study, the issue of whether education creates growth or if growth creates education, is still potentially unanswered. While Talman and Wang (1992) found that on a micro level human capital cannot easily decrease, on a society-wide level it is susceptible to shock. It could therefore be argued that the recent economic downturn might have led to a decrease in the collective human capital, but simultaneously it could be said that a lower global average human capital started the economic downturn in the first place.

This again forces the question of the endogeneity of human capital to be addressed, i.e. has the lower investment led to lower human capital, or has the lower human capital led to lower investment? Many of the streams of literature used for this paper suggest that much of the economic growth can be attributed to the aggregation of all the individuals' increased education, instead of them all acting like one entity (Teles et al 2008).

Therefore, in contrast to the research done by Hanushek et al. (2008; 2013), this paper argues that even though higher education would increase prosperity on a micro level, it does not necessarily correlate with growth in the GDP.

This paper provides political implications for the future development of the Finnish educational policy and it suggests stronger involvement by the government in educating the people to ensure its position as one of the most competitive countries in the world. The future of Finnish education will be crucial for the development of the Finnish economy as a part of the European

Union. Unfortunately, there are multiple issues that need to be dealt with in order for the educational policy to be successful. The ageing population of the entire European Union needs to be accounted for, as the number of students will fall compared to the total population. Another aspect requiring similar attention is the strong urbanisation in Finland. Through urbanisation, the disparity in regional prosperity will continue to grow, and the backwashing effect will only strengthen. At a time when educational policy and investment should be among the highest priorities, the focus of policy makers has shifted away from it, towards cost short term cost saving, even though the both the OECD (2016) and the European Commission (2015) emphasise the need for investment in the future. While the effects of this might not be seen today, the implications for the future are serious (De Grauwe et.al, 2013).

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Appendix 1

Table A6.2a. [1/2] Trends in relative earnings of 25-64 year-olds with income from employment, by educational attainment (2000-11)

Upper secondary or post-secondary non-tertiary education = 100

		Educational attainment	2000 (1)	2001 (2)	2002 (3)	2003 (4)	2004 (5)	2005 (6)	2006 (7)	2007 (8)	2008 (9)	2009 (10)	2010 (11)	2011 (12)
OECD	Australia	Below upper secondary	m	77	m	m	m	82	m	m	m	81	m	**m**
		Tertiary	m	133	m	m	m	134	m	m	m	135	m	**m**
	Austria	Below upper secondary	m	m	m	m	m	71	66	67	68	65	66	**66**
		Tertiary	m	m	m	m	m	152	157	155	160	155	156	**158**
	Belgium[1]	Below upper secondary	92	m	91	89	90	89	m	m	m	91	91	**91**
		Tertiary	128	m	132	130	134	133	m	m	m	131	131	**129**
	Canada	Below upper secondary	82	79	79	81	81	78	78	84	82	80	80	**m**
		Tertiary	142	141	135	138	137	135	136	140	138	138	139	**m**
	Chile	Below upper secondary	m	m	m	m	m	m	m	m	m	m	m	**66**
		Tertiary	m	m	m	m	m	m	m	m	m	m	m	**260**
	Czech Republic	Below upper secondary	m	m	m	m	73	72	74	73	72	71	73	**73**
		Tertiary	m	m	m	m	182	181	183	183	183	188	182	**176**
	Denmark	Below upper secondary	m	87	88	82	82	82	83	82	83	81	81	**81**
		Tertiary	m	124	124	127	126	125	126	125	125	127	129	**128**
	Estonia	Below upper secondary	m	m	m	m	m	m	m	m	91	91	90	**87**
		Tertiary	m	m	m	m	m	m	m	m	129	137	136	**135**
	Finland	Below upper secondary	95	95	95	94	94	94	94	94	93	93	m	**m**
		Tertiary	153	150	150	148	149	149	149	148	147	149	m	**m**
	France[2]	Below upper secondary	m	m	84	84	85	86	85	84	79	79	m	**m**
		Tertiary	m	m	150	146	147	144	149	150	147	147	m	**m**
	Germany	Below upper secondary	75	m	77	87	88	88	90	91	90	87	85	**86**
		Tertiary	143	m	143	153	153	156	164	162	167	157	168	**164**
	Greece	Below upper secondary	m	m	m	m	m	m	m	m	m	76	m	**61**
		Tertiary	m	m	m	m	m	m	m	m	m	151	m	**170**
	Hungary	Below upper secondary	71	71	74	74	73	73	73	72	73	71	73	**73**
		Tertiary	194	194	205	219	217	215	219	211	210	211	210	**207**
	Iceland		m	m	m	m	m	m	m	m	m	m	m	**m**
	Ireland	Below upper secondary	89	m	76	m	79	78	83	77	74	83	85	**m**
		Tertiary	153	m	144	m	174	177	157	161	153	164	175	**m**
	Israel	Below upper secondary	m	m	m	m	m	79	78	83	75	80	71	**72**
		Tertiary	m	m	m	m	m	151	151	153	152	154	152	**151**
	Italy	Below upper secondary	78	m	78	m	79	m	76	m	79	77	m	**m**
		Tertiary	138	m	153	m	165	m	155	m	150	148	m	**m**
	Japan	Below upper secondary	m	m	m	m	m	m	m	80	m	m	m	**m**
		Tertiary	m	m	m	m	m	m	m	148	m	m	m	**m**
	Korea[1]	Below upper secondary	m	69	71	68	69	68	69	70	69	67	69	**71**
		Tertiary	m	144	143	145	144	149	147	150	150	157	151	**147**
	Luxembourg	Below upper secondary	m	m	78	m	m	m	74	m	m	66	66	**m**
		Tertiary	m	m	145	m	m	m	153	m	m	162	159	**m**
	Mexico		m	m	m	m	m	m	m	m	m	m	m	**m**
	Netherlands	Below upper secondary	m	m	84	m	m	m	85	m	81	m	83	**m**
		Tertiary	m	m	148	m	m	m	154	m	159	m	156	**m**
	New Zealand	Below upper secondary	79	78	81	77	75	77	82	76	82	79	79	**79**
		Tertiary	123	120	123	123	116	120	115	117	118	118	124	**118**
	Norway	Below upper secondary	79	79	79	78	78	78	78	79	78	77	76	**m**
		Tertiary	129	131	130	131	130	129	129	128	127	128	128	**m**
	Poland	Below upper secondary	m	81	81	m	82	m	84	m	83	m	83	**m**
		Tertiary	m	166	172	m	179	m	173	m	167	m	169	**m**
	Portugal	Below upper secondary	m	m	m	m	67	67	68	m	m	68	69	**m**
		Tertiary	m	m	m	m	178	177	177	m	m	169	170	**m**

(OECD, 2011).

Appendix 2

Advanced Economies

DIFFERENCE IN RANK: < -5 | -2 TO -5 | -1 TO 1 | 2 TO 5 | >5

	LEVEL			RECENT PERFORMANCE		
ECONOMY	IDI SCORE	IDI RANK	GDP PER CAPITA RANK	IDI TREND	IDI TREND RANK	GDP PER CAPITA TREND RANK
Norway	6.08	1	2	-0.77	23	21
Iceland	6.07	2	12	12.58	1	2
Luxembourg	6.07	3	1	0.15	20	15
Switzerland	6.05	4	3	1.92	7	25
Denmark	5.81	5	5	4.76	3	20
Sweden	5.76	6	6	0.48	14	14
Netherlands	5.61	7	10	0.43	16	22
Ireland	5.44	8	4	9.28	2	1
Australia	5.36	9	7	0.46	15	13
Austria	5.35	10	13	-0.17	21	27
Finland	5.33	11	15	-2.92	29	28
Germany	5.27	12	16	1.72	9	19
New Zealand	5.25	13	20	1.04	13	8
Belgium	5.14	14	17	0.24	19	23
Czech Republic	5.09	15	28	2.88	5	7
Korea, Rep.	5.09	16	24	2.20	6	5
Canada	5.06	17	11	0.29	18	17
France	5.05	18	18	-0.55	22	24
Slovenia	4.93	19	25	-2.39	28	18
Slovak Republic	4.90	20	29	1.49	11	4
United Kingdom	4.89	21	19	0.42	17	12
Estonia	4.74	22	30	1.77	8	3
United States	4.60	23	9	1.62	10	9
Japan	4.53	24	14	1.14	12	10
Israel	4.51	25	22	3.57	4	11
Spain	4.40	26	23	-2.12	27	16
Italy	4.31	27	21	-1.69	26	29
Portugal	3.97	28	27	-1.42	24	26
Greece	3.70	29	26	-1.69	25	30
Singapore	n/a	n/a	8	n/a	n/a	6

(World Economic Forum, 2018).